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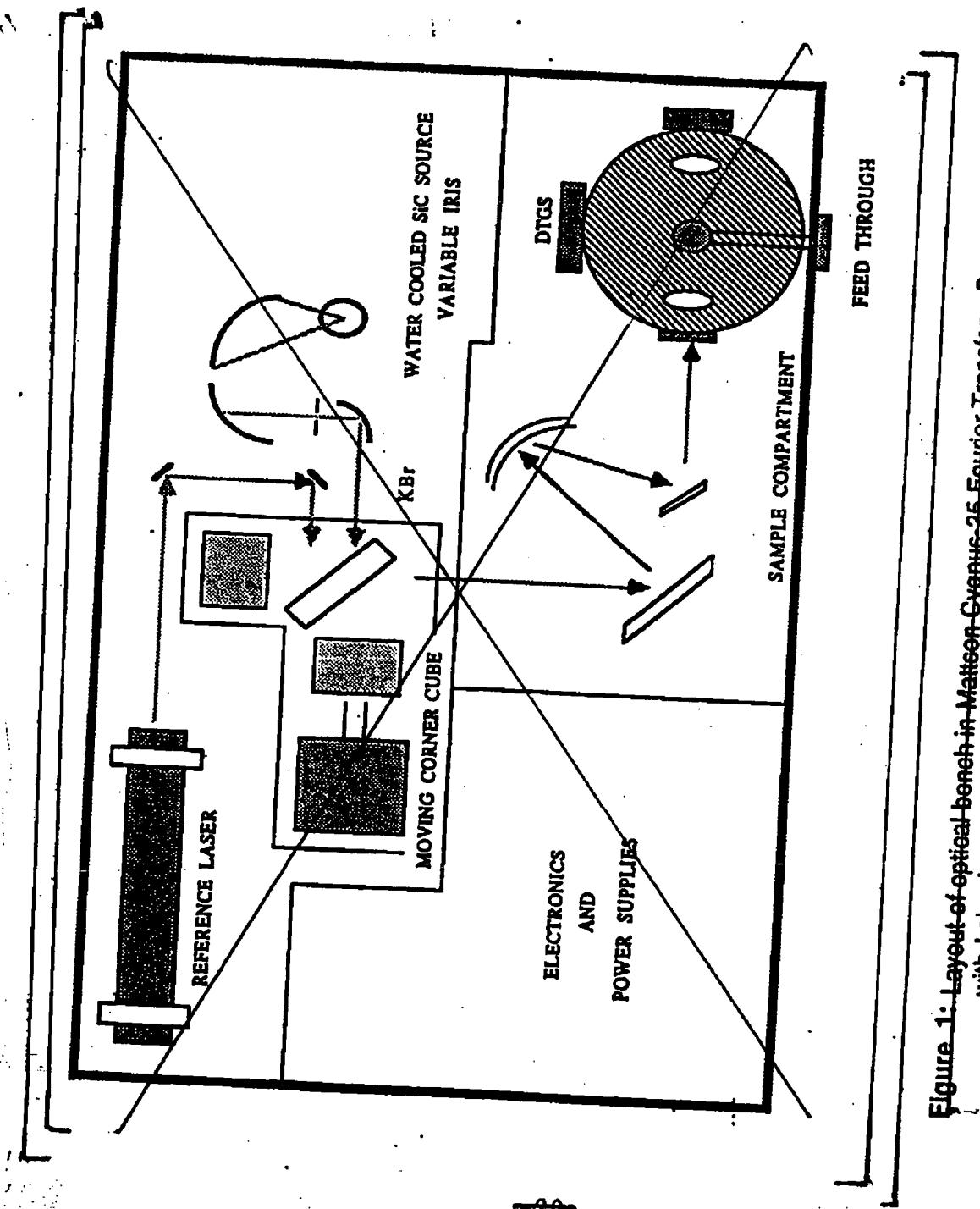
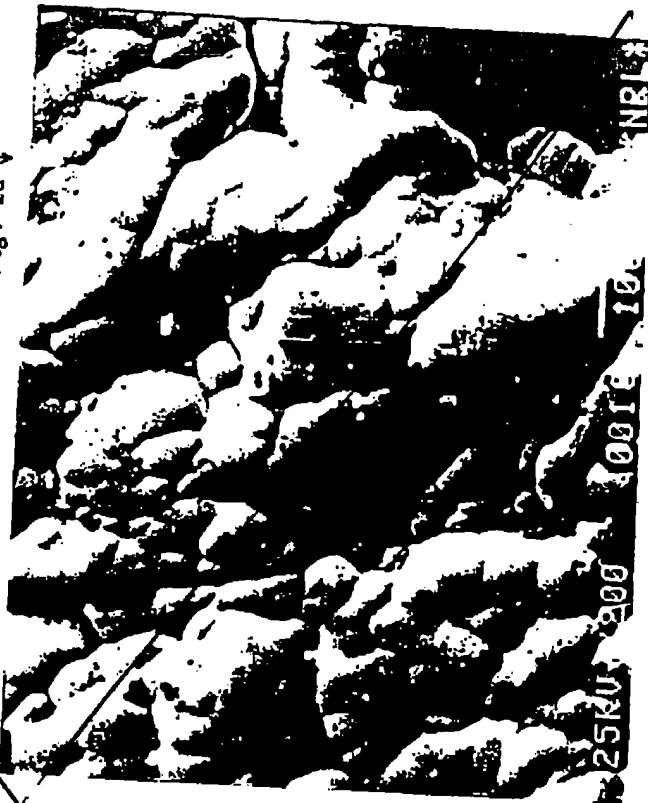


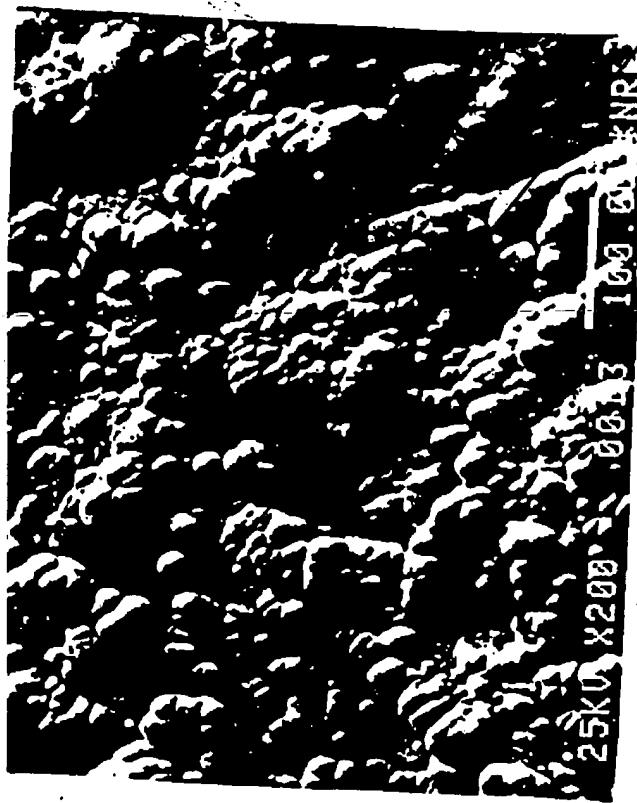
Figure 1: Layout of optical bench in Mattson Cygnus 25 Fourier-Transform Spectrophotometer with Labsphere Integrating sphere accessory installed.



Fig. 2d ↓



↑ Fig. 2c



↑ Fig. 2b ↓



↓ Fig. 2a ↑

Figure 2a-2d. Scanning electron microscope pictures of the lab sphere at 400X magnification (Fig. 2a), the hexene-coating used in the NRL sphere is shown at 100X magnification (Fig. 2b) and 200X magnification (Fig. 2c). The 200X magnification (Fig. 2d) shows the surface at 200X magnification (Fig. 2d) and 500X magnification (Fig. 2d).

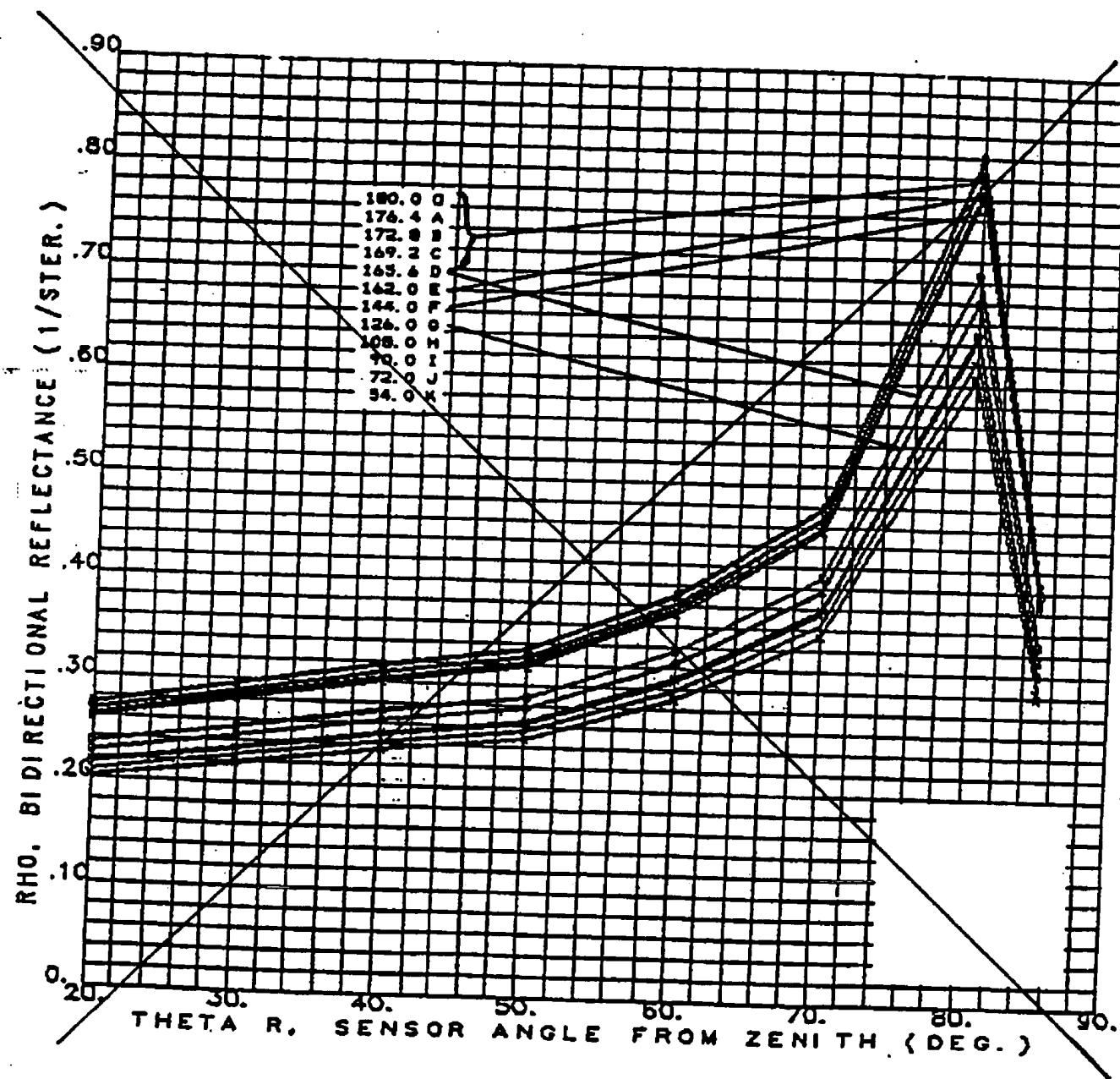


Figure 4: Bidirectional reflectance data for LabSphere 400 micro-inch diffuse gold coating. The data shown was measured at an incidence angle of 20 degrees, a wavelength of 10.6 microns, and a variety of angles in different azimuthal planes ranging from the plane of incidence (top curve) to 126 degrees out of the plane of incidence (bottom curve).

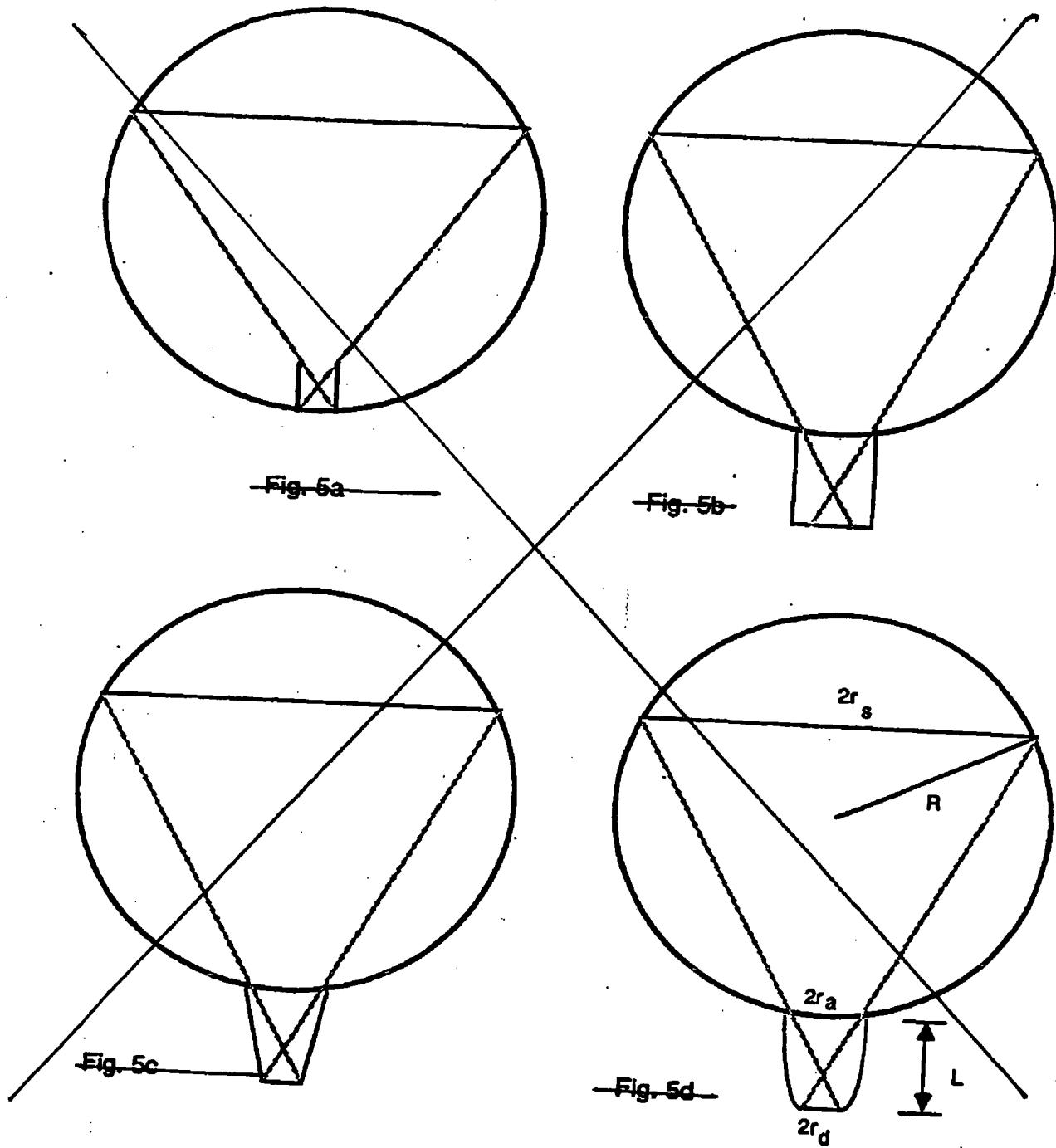


Figure 5: Detector optics coupling schemes: a) baffle, b) estimator, c) reflecting cone, and d) Compound Elliptic Concentrator (CEC).

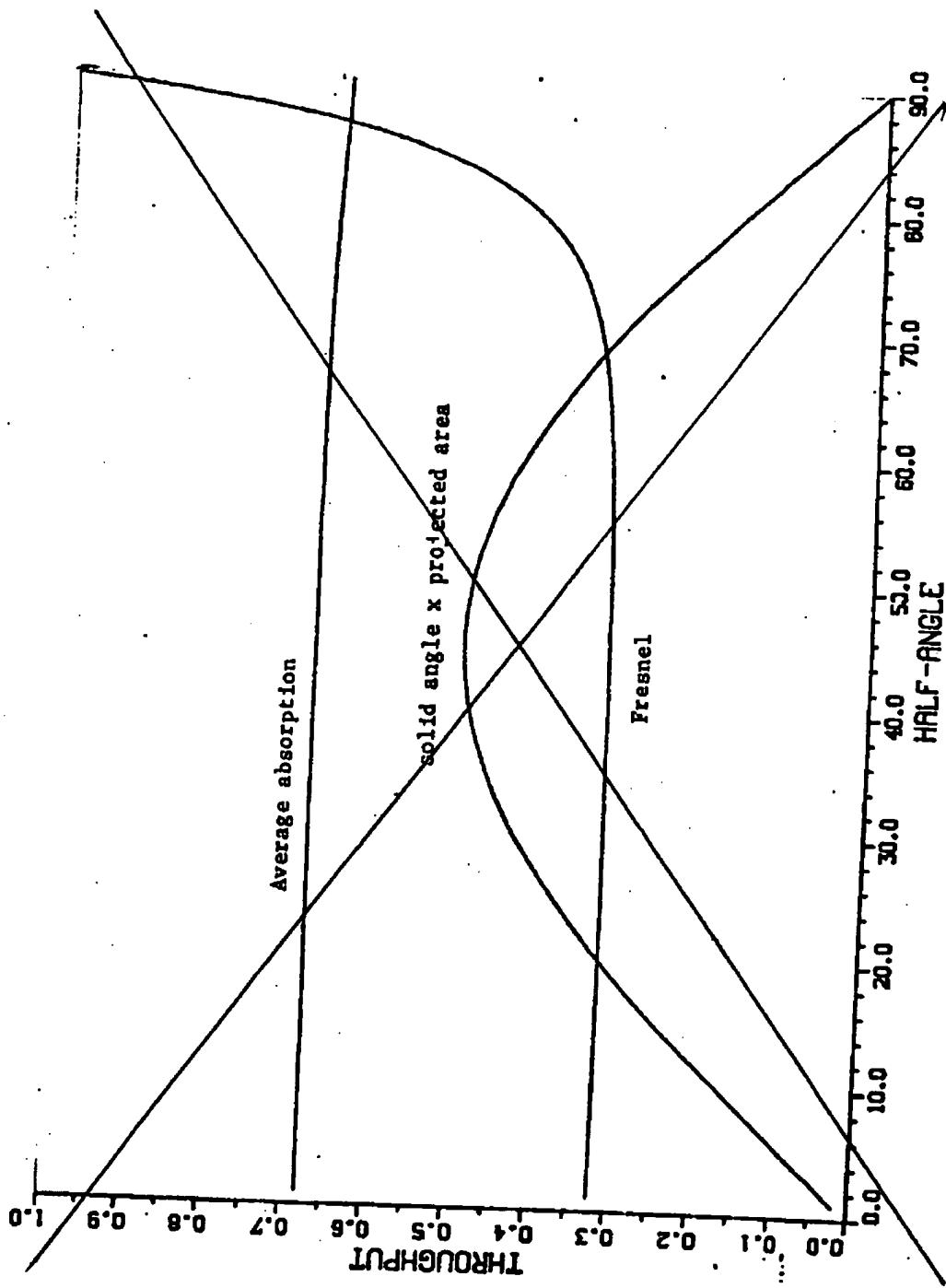


Figure 6: Average absorption vs. cone-half-angle for Lambertian illumination of a 10-micron detector. The high Fresnel reflections at large angles do not decrease the average absorption significantly due to the projected area term in the weighting factor.

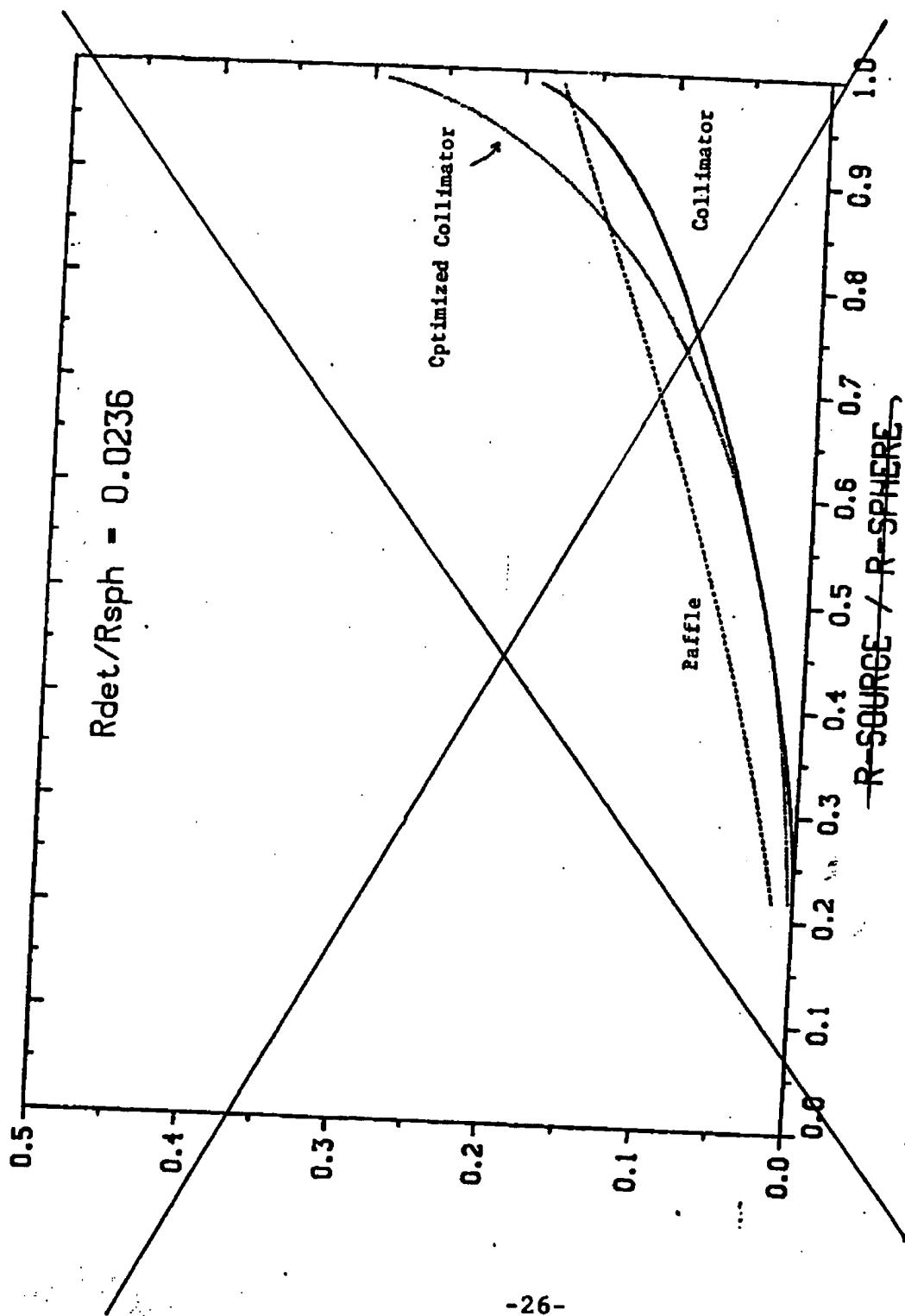
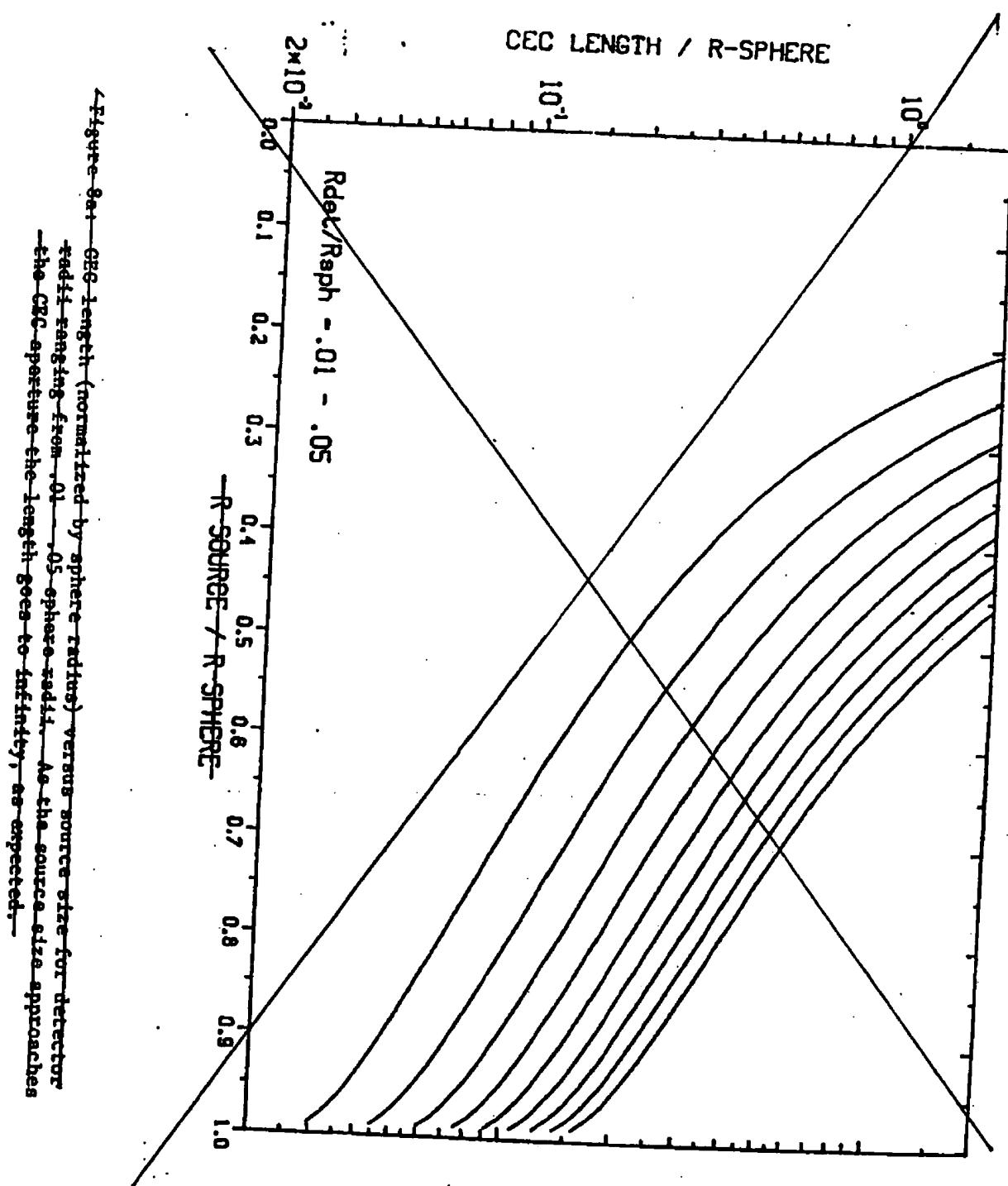


Figure 7: Integrating-sphere-detector-optics throughput (normalized by CRC throughput) vs source radius divided by sphere radius. For a source radius of 0.9, the CRC is over five times more efficient at collecting radiation than the optimized collector.



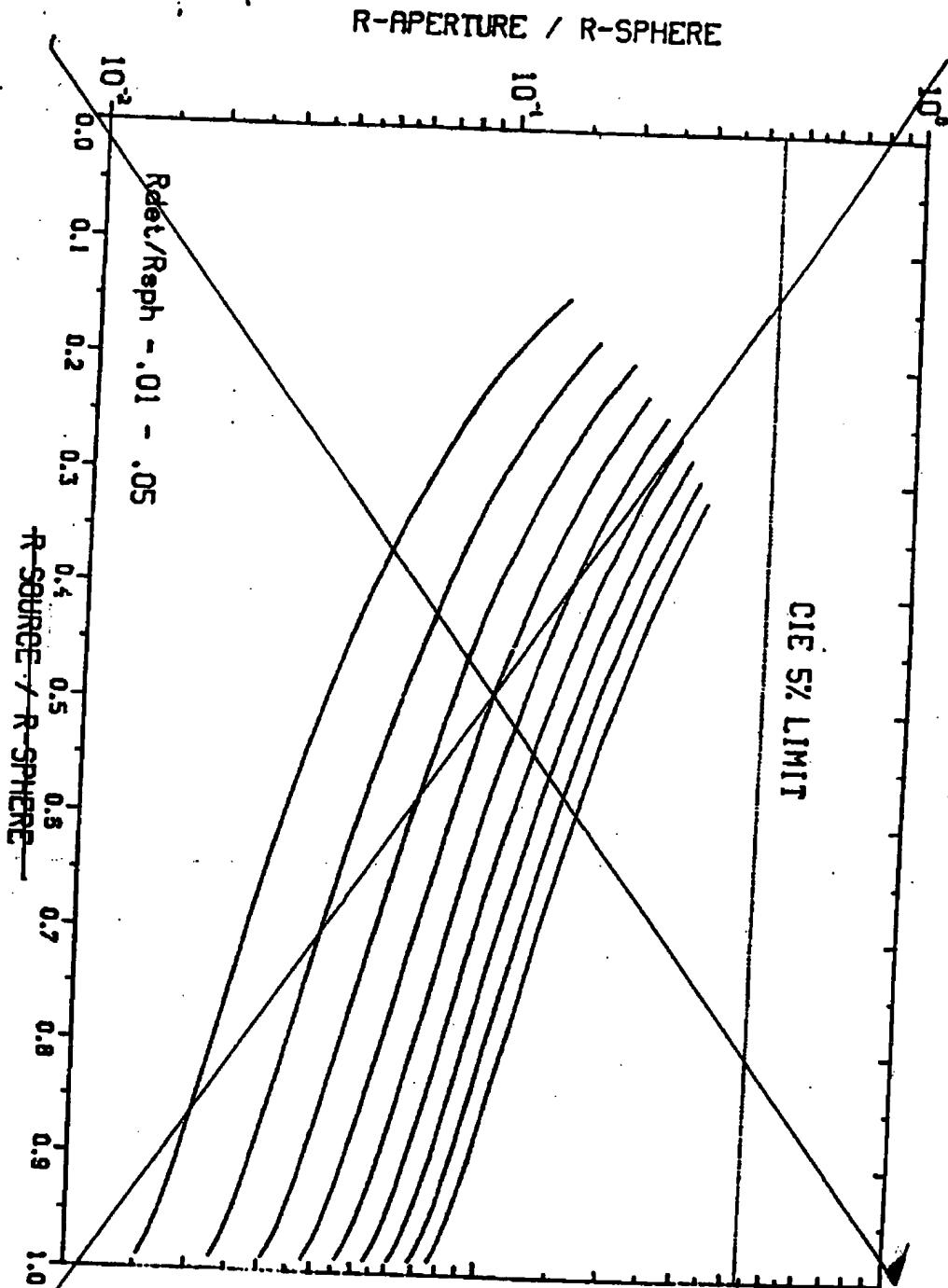


Figure 8b: CIE-aperture-radius (normalized by sphere radius) versus source size for detector radii ranging from .01 to .05 sphere radii. The curves stop length is infinity.

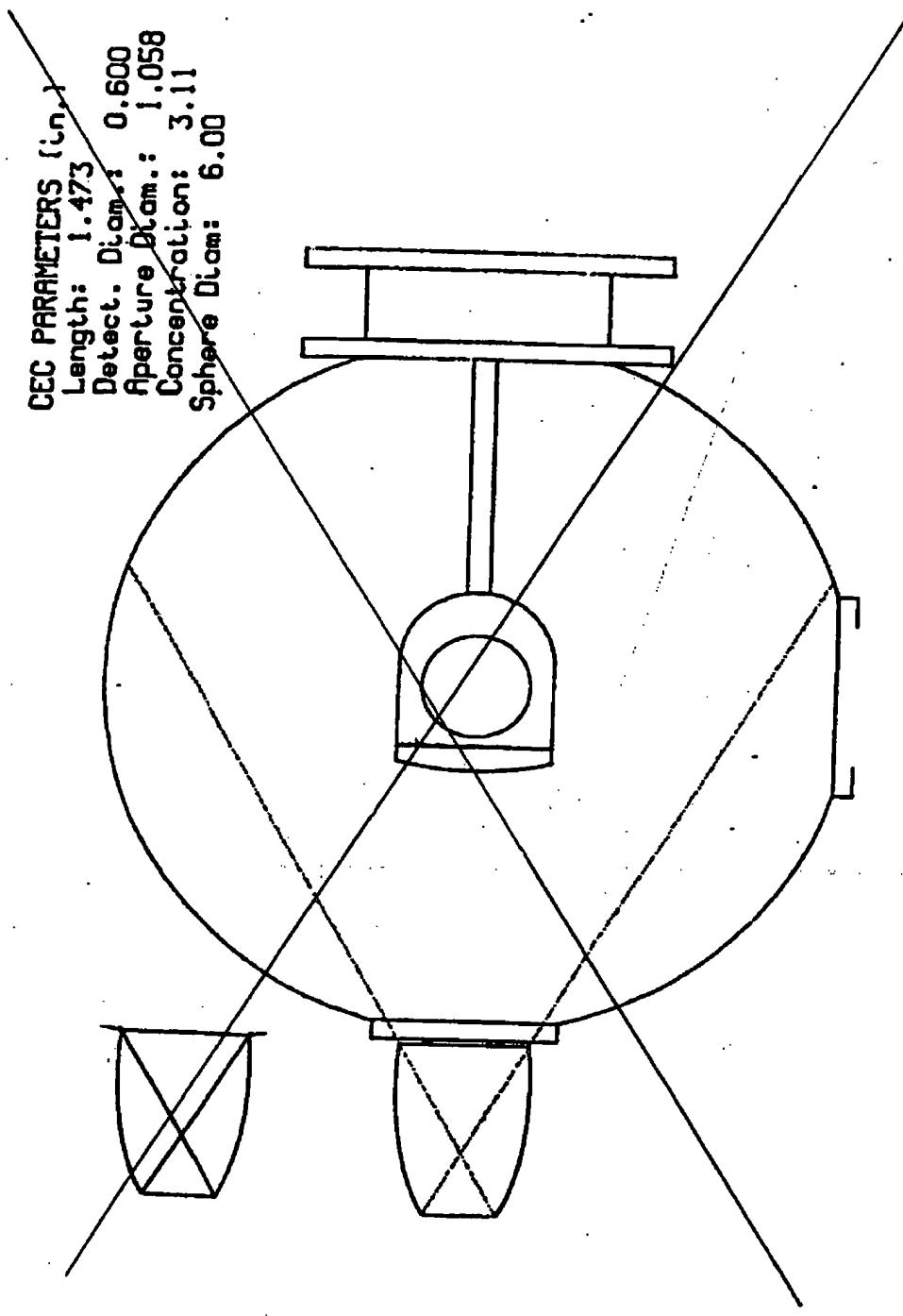


Figure 9: Effect of refraction compensation on the CEC length and concentration. The upper CEC was designed for the same source, sphere, and detector radius as the lower, however, no cover window over the detector was assumed. The concentration and length for the upper CEC are 3.98 and 1.399 respectively, or about 4.5% less than the refraction compensated 650.

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